WHAT IS CLAIMED IS:

1. A symbol synchronizer comprising:

(a) means for deriving a control signal from received samples using a distance metric function; and

(b) timing adjustment means for producing a timing signal based on the control signal.

2. The symbol synchronizer of claim 1 wherein the distance metric function is Euclidean.

3. The symbol synchronizer of claim 2 wherein the distance metric function, denoted as $\rho(x)$, is defined as follows:

$$\rho(x) = x^2.$$

4. The symbol synchronizer of claim 1 wherein the distance metric function is non-Euclidean.

5. The symbol synchronizer of claim 4 wherein the distance metric function, denoted as $\rho(x)$, is defined as follows:

$$\rho(x) = \begin{cases} x^2 & for -k < x < k \\ k^2 & otherwise \end{cases}.$$

6. The synchronizer of claim 1 wherein the deriving means further comprising a first distance metric computation means for computing a first set of metrics from first N consecutive received samples using the distance metric function with respect to all possible symbols.

7. The symbol synchronizer of claim 6 wherein the control signal is derived from a first difference obtained by subtracting a smallest metric from a larger metric among the first set of metrics.

8. The symbol synchronizer of claim 7 wherein the larger metric is a second smallest metric in the first set of metrics.

9. The symbol synchronizer of claim 7 wherein denoting current and the past first differences as $d\lambda_1$ and $d\lambda_2$, the control signal is derived from the value of $d\lambda_1 - d\lambda_2$.

10. The symbol synchronizer of claim 6 wherein the deriving means further comprising a second distance metric computation means for computing a second set of metrics from second N consecutive received samples using the distance metric function, wherein there are P samples apart from the latest sample in the first N consecutive received samples to the earliest sample in the second N consecutive received samples and $P < N$.

11. The symbol synchronizer of claim 10 wherein denoting the smallest metrics among the first and second sets of metrics as λ^l_{min} and λ^e_{min}, respectively, the control signal is derived from the value of $\lambda^e_{min} - \lambda^l_{min}$.

12. The symbol synchronizer of claim 10 wherein denoting the difference between the smallest and the second smallest metrics among the first set of metrics as $\Delta\lambda^l$ and that among the second set of metrics as $\Delta\lambda^e$, the control signal is derived from the value of $\Delta\lambda^e - \Delta\lambda^l$.

13. A method for synchronizing a communication channel, comprising the steps of:

(a) receiving samples;

(b) deriving a control signal from the received samples using a distance metric function; and

(c) producing a timing signal based on the control signal.

14. The method of claim 13 wherein the distance metric function is Euclidean.

15. The method of claim 14 wherein the distance metric function, denoted as $\rho(x)$, is defined as follows:

$$\rho(x) = x^2.$$

16. The method of claim 13 wherein the distance metric function is non-Euclidean.

17. The method of claim 16 wherein the distance metric function, denoted as $\rho(x)$, is defined as follows:

$$\rho(x) = \begin{cases} x^2 & for -k < x < k \\ k^2 & otherwise \end{cases}.$$

18. The method of claim 13 wherein step (b) further comprises the step of computing the first set of metrics from first N consecutive received samples using the distance metric function with respect to all possible signal constellations.

19. The method of claim 18 wherein the control signal is derived from a first difference obtained by subtracting a smallest metric from a larger metric among the first set of metrics.

20. The method of claim 19 wherein the larger metric is a second smallest metric in the first set of metrics.

21. The method of claim 19 wherein denoting current and the past first differences as $d\lambda_1$ and $d\lambda_2$, the control signal is derived from the value of $d\lambda_1 - d\lambda_2$.

22. The method of claim 18 wherein step (b) further comprises the step of computing a second set of metrics from second N consecutive received samples using the

distance metric function, wherein there are P samples apart from the latest sample in the first N consecutive received samples to the earliest sample in the second N consecutive received samples and $P < N$.

23. The method of claim 22 wherein denoting the smallest metrics among the first and second sets of metrics as λ^{l}_{min} and λ^{e}_{min}, respectively, the control signal is derived from the value of $\lambda^{e}_{min} - \lambda^{l}_{min}$.

24. The method of claim 22 wherein denoting the difference between the smallest and the second smallest metrics among the first set of metrics as $\Delta\lambda^{l}$ and that among the second set of metrics as $\Delta\lambda^{e}$, the control signal is derived from the value of $\Delta\lambda^{e} - \Delta\lambda^{l}$.